



Maimonides Medical Center is a non-profit, non-sectarian hospital located in Borough Park, in the New York City borough of Brooklyn, in the U.S. state of New York. Maimonides is both a treatment facility and academic medical center with 705 beds and more than 70 primary care and sub-specialty programs. With a staff of nationally renowned physicians, Maimonides Medical Center strives to conduct quality research, care and education.

[maimonidesmed.org](http://maimonidesmed.org)

## Maimonides Medical Center's Quest for Operational Continuity Via Real-Time Data Accessibility

Hospitals like Maimonides Medical Center demand that critical healthcare data always be accessible, be stored compliantly, and be immediately retrievable – failure to do so can impact care, put lives at risk and subject hospitals to fines. Availability of data is paramount to a hospital's ability to deliver effective care.

Hospitals and health systems today face mounting storage challenges when it comes to securely and compliantly managing the rapidly growing amounts of patient and other business-critical data, while consistently providing real-time, always-on information accessibility. Maimonides Medical Center, based in Brooklyn, N.Y, is certainly no exception. The facility is among the largest independent teaching hospitals in the U.S. and also serves as a treatment facility with 706 beds and an academic medical center. Over 800 physicians rely on Maimonides' information systems to care for patients 24 hours a day, seven days a week.

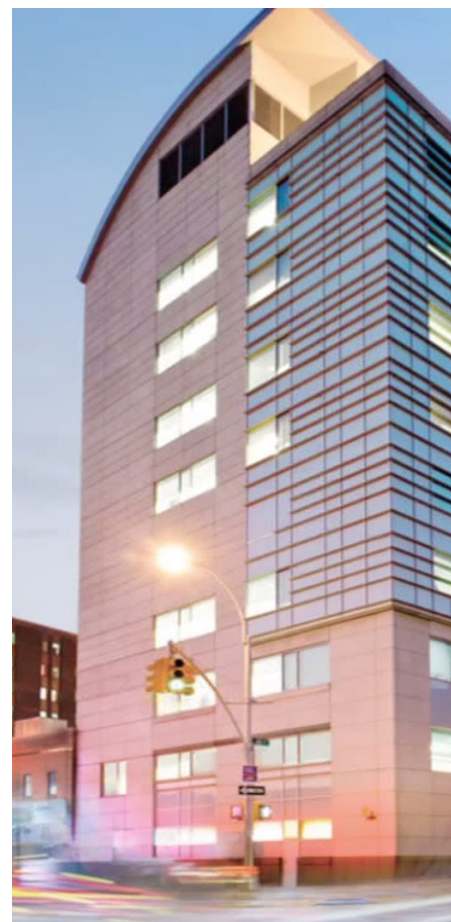
As healthcare organizations like Maimonides Medical Center continue their transition to a data-driven infrastructure, the influx of data generated continues to increase at a rapid pace with no sign of slowing down. For Rogee

Fe de Leon, head of the storage group at Maimonides Medical Center, it was becoming increasingly difficult for his team to maintain systems to keep real-time data at a doctor's fingertips while also keeping up with a growing demand for new and current Electronic Medical Records (EMR), prescription data, medical supply ordering and fulfillment, research data, clinical imaging data and voice dictation. In addition, the organization was challenged by having a number of disparate systems that were not working in conjunction with each other. This ad-hoc approach decreased efficiencies and intelligence around what departments were in need of storage resources. Historically, Maimonides Medical Center relied on storage that was directly attached to mission critical application servers, but that approach was no longer the most efficient or cost-effective solution for the hospital's mounting storage needs. As the volume of and reliance on hospital data evolved, so did the necessity for a fresh look at the organization's storage strategy. A lack of available windows for maintenance and the potentially devastating effects of downtime on the facility's patients and staff only prompted the urgency.

For Fe de Leon and his colleagues, ensuring business continuity through high data availability was a top priority for the IT initiative. This was to be accomplished by maintaining continuous, unbroken hospital operations. Maimonides Medical Center was also looking for a storage platform that was able to securely and seamlessly manage the hospital's storage resource expansion. On the data management side, the organization required an ability to consolidate storage management for mission-critical patient records, while eliminating the labor-intensive need for system administrators to micromanage the capacity requirements of life-saving applications.

### **Real-Time, Highly Available Hospital Data**

When looking for a software-defined storage partner to ensure for highly available storage in real-time, Maimonides Medical Center turned to DataCore Software, as the organizations have a long history of collaboration working together on previous storage initiatives. In this phase of the relationship, the hospital migrated to an infrastructure-wide, Storage Area Network (SAN) spread across two sites – two geographically separated SANs running as active-active data centers. The goal was to handle the data growth in the EMR application and meet existing state and federal require-



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**– Rogee Fe de Leon,  
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ments to store patient records for at least seven years or longer.

Eight direct Fibre Channel switches support this infrastructure, which stores, moves, and protects electronic records for ambulatory, obstetrical, and gynecological services. A little less than one petabyte (PB) of managed storage (“virtual disks”) is used as tier one storage. This storage serves the critical applications for medical records and imaging, including the Picture Archiving and Communications System (PACS), which is the most storage-intensive application. For Maimonides, meeting Health Insurance Portability and Accountability Act’s (HIPAA) requirement for audit trails has been a fairly straightforward process, keeping more log files for a longer period of time. The disaster recovery requirements of HIPAA have been met by replicating the patient data to a second SAN.

The most pressing requirement for Fe de Leon and his team was high data availability for the hospital’s operational and care consistency as four pairs of software-defined storage nodes have been running since 2005. Each pair represents 250 TBs of mirrored, virtual storage capacity, and the physical storage capacity available behind the pairs is almost twice that, or 500 TBs per pair. Total storage capacity is approximately 2 PBs. By centralizing the management of all storage resources as a scalable, fully redundant virtualized pool, the hospital ensures 24/7 access to critical information. As a result, Maimonides Medical Center has eliminated lapses in data availability from hardware failure and storage maintenance.

“High availability was the first and foremost reason for going with DataCore and for continuing with it,” said Fe de Leon. “Now everything mission-critical to the running of the hospital is supported by DataCore’s software-defined storage platform. Users not only receive faster access to data, but they benefit from more server capacity as well.”

## The Virtualized IT Landscape

The drive to deploy virtualized servers at Maimonides Medical Center was no different from most healthcare organizations across the country. The hospital's IT department proactively recognized that sheer demand for servers and for applications from every group within the medical center made sense, both practically and economically, and as such, the organization has significantly ramped up virtualizing servers over the past several years. The medical center now maintains 150 VMs across their systems. Out of a total of 12 VMware ESX hosts, six hosts are clustered into a production environment and the others are clustered in a development environment. The medical center also has numerous physical Microsoft servers, which are clustered between the two sites for the sake of business continuity. The balance of the hospital's hosts run IBM AIX (Unix) and Red Hat Linux, all obtaining their storage from the virtualized storage platform.

DataCore's software currently runs on IBM / Lenovo x3650 servers. These standard x86 machines have been deployed with approximately 20 Fibre Channel ports, each using a combination of Emulex and QLogic host bus adapters (HBAs). All critical systems run entirely on Fibre Channel topology. In the most recent deployment of software-defined storage, the configuration virtualizes one pool of fast Fibre Channel disks on X-IO arrays, as well as two vast pools of high-density, lower-cost, SATA disks on IBM arrays.

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## Maimonides Medical Center Today

Maimonides Medical Center partnered with DataCore to implement the company's software-defined storage platform to eliminate single points of failure and ensure for the continuous, reliable data access. This storage capability is critical to the hospital in terms of operations as well as the ability to consistently deliver the highest levels of care.

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Today, the ability to have rock-solid business continuity remains the overriding benefit that Maimonides Medical Center derives from software-defined storage. DataCore makes it possible for the hospital to metro-cluster applications between two different sites as if they were co-located. With this approach, if for any reason one site happens to be offline (as a result of a planned or unplanned outage), the organization's IT systems will remain up and running – ensuring for reliable, continuous business operations at all times.

According to Fe de Leon, “In terms of DataCore serving as the storage area network backbone for the hospital, you need only know that all of the hospital's medical records, all of its clinical records and of all of its administrative records reside on the DataCore virtualized SANS which serve as the hospital's 'de facto' virtualized storage platform. All of the applications we rely on to run the hospital – including billing – are on DataCore.”

### **Maimonides Medical Center's Software-Defined Storage Goals**

- A storage platform that that was able to securely and seamlessly manage the hospital's storage resource expansion.
- The ability to consolidate storage management for mission-critical patient records.
- Elimination of the labor-intensive need for system administrators to micromanage the capacity requirements of life-saving applications.
- The ability to ensure for business continuity through high availability by maintaining continuous unbroken hospital operations.

### **Maimonides Medical Center Deployment at a Glance**

- DataCore Managed Capacity: 1 Petabyte
- Number of Users: 5,000
- Total Number of Physical Servers within the IT Infrastructure: 400+
- Number of Virtual Servers: 300
- Primary Server Vendor: IBM / Lenovo
- Storage Vendor: IBM and X-IO

## About DataCore Software

DataCore is a leading provider of software-defined storage and adaptive parallel I/O software that makes use of the most efficient and cost-effective modern server platforms to solve the most urgent problem of the storage industry: I/O bottlenecks. The storage virtualization and hyper-convergent virtual SAN solutions offered by DataCore facilitate storage management and free users from being tied to a specific manufacturer by providing hardware-independent architecture.

DataCore's software-defined storage platform revolutionizes storage infrastructures while working towards a software-defined data center of the next generation, with greater utility, better performance, higher availability and easier handling. Further information can be found at [www.datacore.com](http://www.datacore.com)

For additional information, please visit [datacore.com](http://datacore.com) or email [info@datacore.com](mailto:info@datacore.com)

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